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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/23/2003

Cai-Zhong Jiang

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EXAMINER

KRUSE, DAVID H

ART UNIT

PAPER NUMBER

1638

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/669,824	JIANG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	David H. Kruse	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 22,24-33,36-38 and 41-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 43 is/are allowed.
- 6) ☒ Claim(s) 22,24-33,36-38,41 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/1/2007</u> .   | 6) <input type="checkbox"/> Other: _____                          |

### **STATUS OF THE APPLICATION**

1. This Office action is in response to the claims amendment filed 23 May 2008 and the Remarks filed 23 May 2008.
2. Those objections or rejections not specifically addressed in this Office action are withdrawn in view of Applicants' amendments.
3. The provisional obviousness-type double patenting rejection of record over copending application 11/435,388 is withdrawn in view of Applicants' response; the instant claims are not directed to a AP2 type transcription factor.
4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Terminal Disclaimer***

5. The terminal disclaimers filed on 9 January 2008 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent granted on U.S. Patent Application 10/870,198 and U.S. Patent 6,717,034. A has been reviewed and is accepted. The terminal disclaimers have been recorded.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the fourth paragraph of 35 U.S.C. § 112:

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.
7. Claim 25 is rejected under 35 U.S.C. § 112, fourth paragraph, as failing to further limit the subject matter of claim 22 upon which it depends.

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8. Claims 25 remains rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation “conserved domain that is at least 63% identical in its amino acid sequence to amino acids 106-201 of SEQ ID NO: 14” is not adequately supported in the written description and is New Matter introduced into the claims. This rejection is repeated for the reason of record as set forth in the last Office action mailed 9 July 2007. Applicant’s arguments filed 23 May 2008 have been fully considered but they are not persuasive. Applicants argue that the presently amended independent claims comprise the element of a conserved domain that is at least 65% identical to amino acids 106-201 of SEQ ID NO: 14 (page 7, item 11 of the Remarks). This argument is not found to be persuasive because the instant claims has not been so amended. This issue appears to be an oversight by Applicant in the claims as presently amended.

9. Claims 22, 24-33 and 36-42 remain rejected and new claims 42 and 44 are rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This rejection is repeated for the reason of record as set forth in the

last Office action mailed 9 July 2007. Applicant's arguments filed 23 May 2008 have been fully considered but they are not persuasive.

Applicants' arguments refer to Example 6 of the Written Description Training Materials, Rev. 1, March 25, 2008 on page 7, Item 12 of the Remarks. Applicants are reminded that each application is examined upon its own merits. The Examiner notes that said Example 6 indicates that example claim 3 directed to a genus of isolated nucleic acids that hybridize under high stringent conditions to the complement of the exemplified nucleic acid was found to lack adequate written description because there had not been a description of a correlation between structure and function in said example.

Applicants argue that they provided the structure of a considerable number of closely related At-hook transcription factor polypeptides that function similarly by conferring increased tolerance to water deficit and/or increased biomass in plants. Applicants argue that the specification thus discloses other nucleic acids that both hybridize to the complement of SEQ ID NO: 13 and encode polypeptides that confer greater water deficit tolerance and/or biomass. G1073 and the other related sequences listed in Table 1 of the declaration by Dr. Ratcliffe are predicted to hybridize with the G3456 DNA sequence under even conditions less stringent than those being claimed, as shown in Exhibit C, previously submitted (page 8, 1<sup>st</sup> paragraph of the Remarks).

Applicants argue that because hybridization under highly stringent conditions requires a high degree of structural complementarity, nucleic acids that hybridize to the complement of SEQ ID NO: 1 must share many nucleotides in common with SEQ ID

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NO: 13. Applicants argue that the claimed genus necessarily includes partial structures of SEQ ID NO: 13. Applicants argue that the disclosure of SEQ ID NO: 13 and closely related sequences that function in the same manner, combined with the knowledge in the art regarding hybridization would put one in possession of the genus of nucleic acids that would hybridize under stringent conditions to SEQ ID NO: 13 (page 8, 2<sup>nd</sup> paragraph of the Remarks).

Applicants argue that as to function of these sequences, please see the declaration by Dr. Ratcliffe, which shows that sequences closely related to G3456, SEQ ID NO: 14, were tested in plants and conferred the traits of increased water deficit tolerance. G1073, SEQ ID NO: 2, has also shown its ability to make plants more tolerant to water deficit, (e.g., see Figures 8A and 8B of the present specification) (page 8, 3<sup>rd</sup> paragraph of the Remarks).

Applicants argue that nature has preserved both the structure of the second conserved domain and the functions of sequences that possess this domain and that were found using Applicant's description. Applicants argue that a recognizable second conserved domain similar to amino acids 106-201 of SEQ ID NO: 14 is found in every transcription factor sequence, as shown in the column "Second Conserved Domain" in Table 1 of the specification. Applicants argue that, for example, the second conserved domains spanning Figures 5E through 5G for a number of homologs closely-related to G3456, SEQ ID NO: 14. Applicants argue that as the functions of conferring greater water deficit tolerance and biomass are associated with these sequences, these second conserved domains, including those with at least 65% (in the claims also directed to

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hybridization conditions), or 90%, or 95% identity in their amino acid sequences to amino acids 106-201 of SEQ ID NO: 14, are also highly correlated with these functions (page 9, of the Remarks).

Applicants argue that the specification discloses known or disclosed correlation between structure and function by describing the At-hook domains and transcriptional regulatory activity of the disclosed sequences, and another partial structure of G3456 (i.e., the "second conserved domain" of SEQ ID NO: 14), and other relevant identifying characteristics of the protein (e.g., its ability to bind DNA, its ability to confer increased water deficit tolerance or biomass), as well as a list of functional and related molecular species that have recognizable At-hook and second conserved domains within certain hybridization stringency or percent identity guidelines. Applicants argue that the specification also discloses methods for identifying related polypeptides, and working examples in which G3456 and other closely related proteins are successfully isolated and tested using the disclosed methods. Applicants argue that those of ordinary skill in the art of isolating proteins would recognize the inventor to have been in possession of the claimed protein at the time of filing based on these identifying characteristics and the disclosed isolation method (see *Written Description Training Materials*, Example 5) (page 9, last paragraph of the Remarks).

Applicants argue that there is thus a very high correlation between sequences comprise the claimed structure and that function or are expected to function as claimed. Applicants argue that Exhibit C attached to the declarations submitted 9 January 2008 shows that five of six sequences tested (G3456, SEQ ID NO: 14; G3460, SEQ ID NO:

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18; G3459, SEQ ID NO: 16; G2153, SEQ ID NO: 6; G3401, SEQ ID NO: 38) do, in fact, perform the claimed function by conferring greater tolerance to water deficit, and five of six plants tested also confer increased plant biomass (the six sequence, G3457, has not yet been fully tested; for example, no soil-based drought assays have yet been performed). Applicants argue that transformed plants expressing five closely related transcription factor sequences with closely related second conserved domains tested in a full range of water deficit assays confer the claimed functions, establishing a strong disclosed correlation between function and structure (page 10, 1<sup>st</sup> paragraph of the Remarks).

Applicants' arguments have been fully considered but are not found to be persuasive. Both the Libby Declaration and the Ratcliffe Declaration do not support Applicants' arguments. The Ratcliffe Declaration teaches each of the putative orthologs have different ranges of function in their respective transgenic plants. Applicants own evidence shows that the different species do not have the same specific function. In addition, Applicants only teach one species that comprises a second domain at least 90% or 95% identical to amino acids 106-201 of SEQ ID NO: 14. Amino acids 106-201 of SEQ ID NO: 14 only represents approximately 34.3 % of the polypeptide, the At-hook region only represents 3.2% of the protein, and the art recognizes that an At-hook only has to comprise the tripeptide GRP as taught by Aravind *et al* 1998, cited in the previous Office action. Hence, the claims are directed to At-hook proteins that can be up to at least 62.5% identical to SEQ ID NO: 14. Given the evidence taught in the art as outlined in the previous Office action, it remains the Examiner's opinion that one of skill



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in the instant art would not have recognized that Applicants had possession of the invention as broadly claimed.

***Claim Rejections - 35 USC § 102/103***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 22, 24 and 25 are rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over Bevan *et al* (NCBI Accession Number C71448, NIH, National Library of Medicine U.S.A., Bethesda, MD, publicly disclosed 29 September 1997) taken with the evidence of Bevan *et al* 1998 (Nature Vol. 391, pages 485-488) and in further view of Fourgoux-Nicol *et al* 1999, (Plant Molecular Biology 40 :857-872).

Bevan *et al* disclose polynucleotides encoding an At-hook transcription factor having an At-hook domain 100% identical to that of instant SEQ ID NO: 14, and comprising a second domain 71.9% identical to amino acids 106-201 of instant SEQ ID NO: 14.

Bevan *et al* 1998 discloses that the previously disclosed polynucleotides had been identified using BAC clones which the instant art would recognize as being a recombinant construct as recited in the instant claims.

The teachings of Fourgoux-Nicol *et al* can be found in the previous Office action.

Since the second domain of the polypeptide disclosed by Bevan *et al* is 71.9% identical to that of instant SEQ ID NO: 14, polynucleotides encoding said polypeptide would hybridize to the complement of SEQ ID NO: 13 under the claimed conditions given the teaching of Fourgoux-Nicol *et al* without evidence to the contrary.

***Claim Rejections - 35 USC § 103***

13. Claim 26 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Bevan *et al* (NCBI Accession Number C71448, NIH, National Library of Medicine U.S.A., Bethesda, MD, publicly disclosed 29 September 1997) in view of Bevan *et al* 1998 (Nature Vol. 391, pages 485-488) and in further view of Fourgoux-Nicol *et al* 1999, (Plant Molecular Biology 40 :857-872).

The teachings of the cited prior art is outlined above.

It would have been *prima face* obvious to one of ordinary skill in the art at the time of Applicant's invention that one would transform a plant cell with a recombinant construct encoding the taught polypeptide of Bevan *et al* 1998 in order to identify its function. In addition, one of ordinary skill in the instant art would have had a reasonable expectation of success in doing so. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant. See, e.g., *In re Kahn*, 441 F.3d 977, 987, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006),

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motivation question arises in the context of the general problem confronting the inventor rather than the specific problem solved by the invention.

### ***Conclusion***

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Claim 43 is allowed.

16. Claims 22, 24-33 and 36-42 remain rejected and new claims 42 and 44 are rejected.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David H. Kruse, Ph.D. whose telephone number is (571) 272-0799. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anne Marie Grunberg can be reached at (571) 272-0975. The central FAX number for official correspondence is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group Receptionist whose telephone number is (571) 272-1600.

/David H Kruse/  
Primary Examiner, Art Unit 1638  
18 August 2008